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THESIS ABSTRACT

Pre- and Post- test scores were used to compare the effects of the use of a music therapy approach versus a traditional approach to learning and looked specifically at communication and communicative intent in five children with a diagnosis of severe autism. The communication intent recorded included: eye-contact, non-verbal gestures and communication, and verbal output. All students showed an increase in communication in these three areas during the music therapy sessions. Not all skills were sustained after the music therapy sessions ended.

Key Terms: autism, communication, eye-contact, music therapy, non-verbal communication, special education

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I dedicate this thesis to the one person who understands me and keeps me grounded, my wonderful husband, Jesse. I owe everything to you. I love you. Thanks to all of the professors at CSUSM who have supported me through this leaning process.

CHAPTER ONE

Introduction

Background

In 1990, the United States Congress renamed the *Education of the Handicapped Act* to *Individuals with Disabilities Act* (IDEA, PL 101-476). One of the changes in the new law included the addition of autism to the list of disabilities that qualify a student for special education services in a public school (Armstrong & Darrow, 1999).

Bunton-Pierce & Dunlap (1999) described autism as a developmental disorder that can affect a person's ability to communicate, understand language, play, and interact with others. Under the U.S. Department of Education federal register: rules and regulations (2006), the disability is described as:

> A developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three, that adversely affects a child's educational performance. Other characteristics often associated with autism are engagement in repetitive activities and stereotyped movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences. (p. 46756)

Although many individuals with autism are able to communicate with the use of a picture exchange communication system (PECS), or other alternative communication devices, the majority of people diagnosed with autism remain

severely handicapped in their ability to communicate and socialize with other people (Autism Research Institute, 2006).

Leo Kanner first identified autism in 1943. Kanner estimated that autism occurs in approximately four out of every ten thousand children (Kanner, 1943). Autism is "the second most common developmental disability…even more common than Down syndrome" (Division TEACCH, 2006, ¶ 1). According to Tidmarsh and Volkmar (2003), autism is considered to be

> A delay in social development, in language, or in symbolic play must be present before age 3 years. A typical example is a 3-year-old child who does not speak and does not respond when parents call his or her name. Such children seem to be in their own world when left alone; in day care, they tend to isolate themselves from the group. They do not play with toys but, instead, perhaps repetitively stack blocks or push a toy car back and forth while lying on the floor. They are sensitive to loud noises and cover their ears when trucks pass by. They flap their hands and turn their bodies in circles. (2003, ¶ 6)

Children who are diagnosed with autism begin showing symptoms before the age of three. Some of the symptoms include: problems with language development, problems with engaging in social interactions, and highly focused and repetitive actions and interests in objects (Division TEACCH, 2006). Autism is considered a *spectrum* disorder. According to the DSM-IV (*Diagnostic and statistical manual of mental disorders*, Vol. 4), there are several different types of disabilities classified under the autism spectrum. These include: *Asperger's syndrome*, *pervasive*

developmental disorder (PDD), and *autism* or *autistic disorder*. Each of these types ranges in severity from mild to severe (American Psychiatric Association, 1994). “Asperger's disorder is a milder variant of autistic disorder. The name "Asperger" comes from Hans Asperger, an Austrian physician who first described the syndrome in 1944.” (Asperger’s Disorder Homepage, 1996, ¶ 1). Pervasive developmental disorders are characterized by severe and pervasive impairments in several areas of development: social interaction skills; communication skills; or the presence of stereotyped behavior, interests, and activities (American Psychiatric Association, 1994).

Once children who have been diagnosed with a qualifying disability such as autism reach public school age (age three though twenty-two), they qualify for *related services*. These services include: Adapted Physical Education (APE), Occupational Therapy (OT), Speech and Language Pathology services (SLP), and, in some cases, Music Therapy. According to Dempsey & Forman (2001), the range of available treatments for autism is extensive, and they are very specific for the educational setting. These *related services* are considered traditional approaches to treating the symptoms of autism.

There are also many alternative or innovative treatments that have been used and are being used with children with a diagnosis of autism. Some of these alternative treatments include: strict dietary changes (i.e., gluten-free diet, hyperbaric treatment, vitamins and supplements), and neurofeedback therapy (locally performed at the Drake Institute of Los Angeles). These therapy approaches do not typically qualify as

a part of the *related services* provided for children with autism in the public school system.

One additional therapy for children with autism that is becoming more prevalent in schools is music therapy. The American Music Therapy Association (2002) defines music therapy as:

> The prescribed use of music by a qualified person to effect positive changes in the psychological, physical, cognitive, or social functioning of individuals with health or educational problems. Music therapy is the clinical and evidence-based use of music interventions to accomplish individualized goals within a therapeutic relationship by a credentialed professional who has completed an approved music therapy program. (AMTA, 2002, ¶ 2).

Children with autism who do not respond appropriately to verbal communication or social speech will respond better to language used through music (Pronovost, 1961). Thaut, (1998) found that children with autism perform better at basic skills when introduced to music than without. Researchers have noted the benefit of using music to teach children with autism and have begun to investigate using music to teach children with autism to help modify their behavior and communication skills (Patterson, 2003; Thaut, 1998; Armstrong & Darrow, 1999; Shore, 2003; Chadwick, Nash & Wimpory, 1995). As with all *related services*, an assessment must be used to determine if using music therapy with a particular child would be educationally beneficial (Patterson, 2003).

Statement of the Problem

Children with autism need effective communication strategies to support them in their interactions with others. To develop better communication skills, it is essential to develop receptive and expressive language skills as much as possible. Children with autism struggle daily with communication. There are many different approaches to teaching communication skills to individuals with autism. Music therapy is an emerging therapy approach to teaching a variety of skills to children with autism, and most importantly, communication skills. Music therapy can be a non-threatening and enjoyable way for many children who struggle with both expressive and receptive communication to find a way to let them be understood by others. Many parents report that communication is the most important skill they hope their child with autism will develop. Music therapy is a way to approach teaching communication that is both educational and functional for a variety of children on the spectrum.

Purpose of the Study

The purpose of this research and study is to explore the benefits of communication, if any, to using a music therapy approach to teach both verbal and non-verbal communication skills in a classroom setting with children diagnosed with moderate to severe autism. Prompted communication is language that is used after an appropriate model has been given. Spontaneous language can be gestured by the child, a physical response, a verbal response, or a response through the use of an alternative communication system or device, for example, PECS (picture exchange

communication system) or an AAC (alternative assistive communication) device. These devices include both static and dynamic voice output systems. These systems allow a child to communicate with others when they are unable to do so verbally.

This study will attempt to answer the following questions:

1. Do children with moderate to severe autism respond verbally more often during a music therapy approach to learning versus a non-musical approach to learning?

2. Do children respond with more instances of eye contact during a music therapy approach to learning versus a non-musical approach to learning?

3. Do children respond both by prompted phrases and spontaneously during a music therapy approach to learning more often versus during a non-musical approach to learning?

Research Question and Hypothesis

The research question for this study is: In what ways does the music therapy approach increase the interactive verbal and non-verbal skills of students with moderate to severe autism in a structured classroom setting? Based upon the research and previous studies, the hypothesis is that in structured music therapy sessions, students with autism will increase their intentional communication skills more than they do during the sessions in which no music is used.

Significance of Study and Application

This study will explore the benefits to communication for children with moderate to severe autism through the use of music therapy. Music therapy is an emerging therapy and is emerging as a *related service* offered at a child's IEP (Individual Education Plan) for children with a diagnosis of autism and related disorders in a public school. Many educational approaches and programs to help teach students with autism are being used in the classroom setting (Dempsey & Foreman, 2001). Studies that have shown children with autism have a special receptiveness to music, which can be the key to improving the quality of life for them (Armstrong & Darrow, 1999).

Operational Definitions of Terms

Autism: a developmental disability significantly affecting verbal and non-verbal communication and social interactions that adversely affects educational performance (DSM-IV: *Diagnostic and statistical manual of mental disorders*, Vol. 4).

Asperger's syndrome (AS): Persons with AS have a normal IQ and many individuals (although not all), exhibit exceptional skill or talent in a specific area. Because of their high degree of functionality and their naiveté, those with AS are often viewed as eccentric or odd and can easily become victims of teasing and bullying. While language development seems, on the surface, normal, individuals with AS often have deficits in pragmatics and prosody. Vocabularies may be extraordinarily rich and some children sound like "little professors." However,

persons with AS can be extremely literal and have difficulty using language in a social context (Kirby, 2005).

Pervasive Developmental Disorder (PDD): a developmental disorder causing severe and pervasive impairment in several areas of development: social interaction skills; communication skills; or the presence of stereotyped behavior, interests, and activities (American Psychiatric Association, 1994).

Related Services: IDEA 97 defines this as: "Transportation and such developmental, corrective, and other supportive services as are required to assist a child with a disability to benefit from special education..." (Mattson, 2001).

Adapted Physical Education (APE): "an individualized program of developmental activities, exercises, games, rhythms, and sport designed to meet the unique physical education needs of individuals with disabilities" (Council for Exceptional Children, 2004).

Occupational Therapy (OT): "Occupational therapy is skilled treatment that helps individuals achieve independence in all facets of their lives. Occupational therapy assists people in developing the "skills for the job of living" necessary for independent and satisfying lives" (AOTA *American Occupational Therapy Association, INC.*, 2006).

Speech and Language Therapy: Speech-language therapy is the treatment for most children with speech and/or language disorders by a speech and language pathologist (SLP). A speech disorder refers to a problem with the actual production of

sounds, whereas a language disorder refers to a difficulty understanding or putting words together to communicate ideas (U.S. Department of Education, 2002).

Music Therapy: "The prescribed use of music by a qualified person to effect positive changes in the psychological, physical, cognitive, or social functioning of individuals with health or educational problems." (American Music Therapy Association, 2002)

Picture Exchange Communication System (PECS): a system developed in 1985 as a unique augmentative/alternative training package that uses pictures to teach children and adults with autism and other communication deficits to initiate communication (Bondy & Frost, 2006).

Individualized Educational Plan (IEP): A written statement for each child with a disability, developed, reviewed, and revised by a team that includes parents, teachers, administrators, and other relevant personnel, according to the requirements of IDEA (U.S. Department of Education, 2006).

Communicative intent: "Intent to convey a message distinguishes communication from non-communicative speech, verbalizations and gestures. When the child anticipates an outcome from his communication, regardless of the form (i.e.: speech, gesture, etc.), he demonstrates intent" (Stokes, 1999, ¶ 4).

Special Day Class (SDC): Special Day Class in a public school facility is a placement setting that provides intensive instruction and services to pupils when the nature or severity of the disability precludes their participation in the regular school program for most of a school day. Children placed in self-contained special classrooms may

receive part- time instruction in a regular class or self-contained special classrooms full-time on a regular school campus (E.C. 56364). Special Day Classes in public separate facilities are a placement setting in which disabled children and youths receive special education and related services for [a minimum of 49%] of the school day in a public separate (isolated) facility (California Department of Education, 2006, ¶ 1-3).

Conclusion

In conclusion, this study will attempt to explore the benefits to using a music therapy approach with children diagnosed with moderate to severe autism in a classroom setting. The investigator will look for instances of communicative attempt during a non-music therapy approach versus using a music therapy approach.

In the next chapter, the investigator will provide a review of the current literature that examines the effects of music and music therapy on the communication skills of students with autism.

CHAPTER TWO

Literature Review

Music Therapy

The American Music Therapy Association (2002) reports that music therapy enhances one's quality of life and can assist with the development of relationships. According to the American Music Therapy Association (2002):

> Music therapy is the clinical and evidence-based use of music interventions to accomplish individualized goals within a therapeutic relationship by a credentialed professional who has completed an approved music therapy program…the prescribed use of music by a qualified person to effect positive changes in the psychological, physical, cognitive, or social functioning of individuals with health or educational problems. Music therapy is considered a powerful and non-threatening medium and because of it unique outcomes are possible. (AMTA, 2002)

Music therapy is used in a variety of non-threatening mediums and with many different approaches. Gourney (1998) describes how music therapy is an evolving discipline. The American Music Therapy Association (2002) also reports that there are many different ways to use music with a therapeutic approach. Music therapists can be used to treat patients with Alzheimer's, people who are terminally ill, children and adults with a variety of special needs, individuals on chemical dependency, at-risk youth living in disadvantaged areas, teachers on the verge of burn-out, children with autism,

and many others. Music therapy reaches a broad range of people with a variety of needs all over the world.

Music therapy is performed by trained professionals and is most commonly used for individuals with special needs. The focus of music therapy is using a music approach towards development of goals in the areas of motor skills, social development, self-awareness, and cognitive development (Patterson, 2003). According to Patterson (2003), the role of a music therapist in the school setting is to assess a child's needs and teach to academic and social skills in areas of deficit both with and without music. One purpose of using music in therapy is to use songs to teach a skill (Zoller, 1991).

In his 1987 study, Hicks (as cited in Zoller, 1991) discovered that when he taught using rap music, children who were 3 and 4 years old learned more names of unfamiliar body parts as opposed to those who instructed without the rap music. There was a similar study in 1981 conducted by Get Ready Inc., which explored the use of rap music as a motivational tool to learning the eight parts of speech with fourth-grade students. The results showed a considerable increase in recognition with the group that received the rap music approach (Zoller, 1991).

A music therapist is trained to implement strategies that will help to strengthen certain skills through participation in musical experiences (Patterson, 2003). The goal is to help all skills learned to generalize into everyday situations. The purpose of a music therapist in a school district is to use music to achieve non-musical goals in a classroom setting. Music therapists structure lessons around music or rhythm to teach skills such as math, reading, social skills, communication, and other areas of need. Music therapy is

being used for a variety of children in the school systems, but research shows that it is particularly useful in addressing the specific needs of children on the autism spectrum (Thaut, 1998; Nordoff & Roberts, 1977). Gourney (1998) described the role of music therapists work with teachers and other therapists, which is to plan and implement treatment tailored to a specific child's needs according to the Individual Education Program (IEP). Music therapy, as a service provided according to an IEP, is recommended when it has a certain level of significance in motivation and or benefit towards a child's educational program (Patterson, 2003). This therapy service falls under the IEP category of *related services*.

Related services are services that may include corrective, developmental, or support services, such as music, art, and dance therapy (Patterson, 2003). The US Department of Education (1999) reports if these services are necessary in assisting a child with special needs to benefit from special education in order to be given *free and appropriate public education* (FAPE), then the service is considered a related service. Parents have had a difficult time getting school districts to provide music therapy as a related service. In response, Dr. Kenneth Warlick (2000), director of the Office of Special Education Programs for the Department of Education, states: "If the IEP determines that music therapy is an appropriate related service for a child, the team's determination must be reflected in the child's IEP, and the service must be provided at public expense and at no cost to the parents" (p. 28-32).

Music therapy is an emerging therapy being implemented with children on the autism spectrum (Dempsey & Forman, 2001; Duffy & Fuller, 2000; Shore, 2003; Thaut,

2000). Studies have focused on the benefits of music therapy with school-age children diagnosed with pervasive development disorder (PDD) and, more specifically, autism. Significant behavior improvements have been reported when children are treated with interventions using a music therapy approach. Some of the improvements observed in behavior have been the development of communication skills and social skills with children diagnosed with autism (Brownel, 2003).

Communication and Autism

Hoshizaki (as cited in Zoller, 1991) defined communication as combinations of rhythm, melody, speech, and gestures. Like math, he suggested, music is a *universal language.* Nash (1974) described rhythm and melody as "innate forces at birth, placing them at the core of human expression and development" (p. 19). For children, music can be a more natural medium to learn through. This is especially true as it relates to learning speech and language skills. Music is also fun and enjoyable, which can help maintain students' interest while they are learning a variety of skills (Zoller, 1991). According to Zoller, by using music with children, one is exposing them to a multi-sensory experience that enhances many skills and has an impact on their development of speech and language skills.

Communication seems to be the most difficult area for children with autism. Children with autism demonstrate an obvious difficulty with expressive language, and this has multiple implications in the school setting. Kanner (1943) identified some of the difficulties children with autism demonstrate with language as: *muteness*, *delayed echolalia* (repetitiveness of words or phrases), *pronoun reversals*, *word substitution*, and

literalness. The most obvious communication deficit proves to be spontaneous speech. Children with autism can learn rote language and what educators define as *functional language*, but they have an extremely difficult time relating to situational or conversational language.

Pronovost (1961) noted that children with autism who do not respond appropriately to verbal communication or social speech respond to language used through music. Thaut, (1998) found that children with autism perform better at basic skills when introduced to music than without. Researchers have noted the benefit of using music to teach children with autism and have begun to investigate using music to specifically help modify behavior (Patterson, 2003; Chadwick, Nash &Wimpory, 1995). Music is considered by many as a universal language, which helps facilitate relationships, learning, self-expression, and communication—all the areas of deficit for children with autism.

"Children with autism have a need for structure and organization in their lives" (Grandin & Scariano, 1986). Music is inherently structured and predictable. According to their study (and from the researcher's observations), children with autism seem drawn to music, which may be due to its repetitive and rhythmic nature. Music in a classroom can engage students with autism, as well as provide them with an environment in which they can learn specific skills. According to Darrow and Armstrong (1999), music in a classroom creates a non-threatening environment for students with autism and their peers, which can help to promote initiation of communication. A musical environment is an environment in which social and academic integration can occur naturally.

As respected experts in the area of music therapy, Nordoff and Roberts (1971) note that music could be a tool for reaching not only children with autism, but also any children with language delays. They have also suggested that there are specific guidelines in the areas of intonation, range, rhythm, and tempo. Songs should be used in a way that they mirror or are as close to the intonations of speech patterns. Because children with autism respond verbally to repetition and rhythm, songs with repeating lyrics are generally best to use for the purpose of teaching communication skills. Nordoff and Roberts (1971) also state that the best way to use music to teach communication is to stress syllables with a strong beat and keep the tempo slow enough to make sure the children can readily understand the words being used. Songs with repeated lyrics allow children to comprehend the message and have more practice with language.

Communication and social interaction are very closely related. Engaging in and listening to music can become an enjoyable social event. Music therapists can design lessons to create interaction among children in small group settings. Songs are used to help children initiate interaction, to illicit eye contact, allow for choice making, and follow instructions. Strategies used in a music therapy session are to use songs and/or music to help students to with verbal imitation, initiation of language, increase vocalizations and length of utterances, and learn new vocabulary, followed by fading music to spoken language (*Coast Music Therapy, 2006).*

A variety of approaches have been used to elicit communication skills from children during music therapy sessions. Songs can be created to focus on eye contact and social greetings. Other approaches use music to modify behavior and model appropriate

behavior for children with autism. According to Thaut (1998), there have only been a few studies that have focused on the particular aspects of musical performance in children with autism.

Educational experts have completed studies with individuals diagnosed with autism using a musical teaching or music therapy approach. Shore (2003) found that while working with students with autism without any functional communication, they had a variety of vocabulary in their heads that was learned from songs. When he worked with particular students with autism he found they responded to him more often and with appropriate conversational language when he would sing to them. Another benefit he found to using a music therapy approach was it helped to control behaviors in the classroom, as well. Music in his program helped to keep children focused and on-task. He concluded, after his study, that music helps to provide alternative means of communication for children with autism as well as help organize thoughts and assist with improving self-esteem (Shore, 2003).

Clarkson (1994) has had many years of experience working in the music therapy field, and specifically, in creative music therapy and conducted a study with a 24-year-old young man diagnosed with autism. The individual was always attracted to music and began his music therapy with Clarkson in 1988. Initially, she used music to gain contact and interaction with the student, and eventually she used music, along with *facilitated communication,* to help him develop better communication skills. *Facilitated communication* is an approach to teaching in which a facilitator holds the child's hand or

wrist, while the child uses a computer or typewriter to type for the purpose of communicating (Clarkson, 1994).

By 1992, Clarkson reported that in three years' time, the student's behavior had improved. He made eye contact during sessions, and was able to use facilitated communication to type sentences in order to communicate with others. According to Clarkson (1994), "Music can be a valuable tool not only for reaching students with autism but for also working with any children delayed in language" (¶ 10).

Chadwick, Nash, & Wimpory (1995) conducted an evaluative case study with a two-year follow-up on the benefits to musical interaction therapy (MIT) with children diagnosed with autism. Musical interaction therapy is different than the describe music therapy, but has similar aims and goals for children with autism. MIT synchronizes live music for adult to child interactions. MIT aims to allow children with autism to predict the actions of their partner based upon the music used. MIT uses non-verbal activities and attempts to solicit social interactions and interpersonal contact, whereas music therapy is used primarily with children with autism to help facilitate social interactions, communication, and develop academic skills.

The subject used for the study conducted by Chadwick, Nash, & Wimpory (1995) was a three-year-old girl with a diagnosis of autism under the DSM-III-R diagnostic criteria for autism. Her diagnosis of autism was in the severe range, and she was almost completely non-verbal. The musician and the mother of the child worked together to create spontaneous music to the child's daily actions. "One example is when the child would walk around the room, the musician would play the piano and sing something like

'walking around the room, we walk around the room' and the mother would also sing and walk around the room" (Chadwick, Nash, & Wimpory, 1995, ¶ 9). They would also create play scenarios and play music to match the actions, labeling any social interactions with songs. The researchers video taped the sessions and observed the number of eye contacts per minute, frequency of child-initiated interactions, and time passed without social interactions. The results of this study are encouraging. The child had a mean baseline of *six minutes of time passed* without social interaction before the music was introduced and following the MIT; the child always gave social acknowledgement and most occurred within a minute of the MIT beginning. The other data also supports an increase in eye contact and in child-initiated interactions. The two-year follow-up also showed the improvements were sustained, and the girl was considerably more tolerant to social interactions (Chadwick, Nash & Wimpory, 1995).

Research suggests there are benefits to using a music therapy approach in a program with children diagnosed with autism. Some of benefits from studies have shown development and improvement of basic communication skills. Additional research and studies have explored other benefits, but as it relates to children with autism, the music therapy approach has not been studied in depth. It has not explored the benefits to communication using a music therapy approach with children diagnosed with severe autism. Further research is needed to determine the benefits, or lack thereof, to using a music therapy approach with the population of children diagnosed with moderate/severe autism. The research needs to focus on the specific improvements to communications

skills, including, but not limited to, eye contact, verbalizations, non-verbal intent, use of augmentative communication devices, and solicited and spontaneous verbal output.

In conclusion, a review of the literature reveals that music may be beneficial and soothing for those on the autism spectrum. The research lacks significant studies as to the benefits of music as an educational tool for communication skills with children with autism. In the next chapter, the investigator will describe the methodology utilized in her study, which is designed to attempt to find the specific benefits to communication through music for children on the autism spectrum.

CHAPTER THREE

Methodology

Design

The design used in this study was a One-Group Pretest-Posttest Design. This design was selected to determine the effects of the treatment by comparing pretest and posttest scores. Pretest from all six children during small group sessions allowed for a comparison of growth to be determined after treatment with the use of a posttest. A pretest and posttest were done through observations in the classroom setting during twenty-minute group sessions. Each pretest and posttest was a combination of three sessions that were compiled to get a mean score for each child. Tally marks were documented for each incident of communicative intent from each child during a twenty-minute work session.

Setting

The school district in which this study was conducted is located in a small suburban town in North San Diego County. This district has seven elementary schools in which there are three special day classes (SDCs), two mild-moderate SDCs, and one regional severely handicapped (SH) special day classroom. The participants from this study were students in the regional SH class. A special day class is a class in which children have significant delays and their disability precludes them from participation in a regular education classroom. A special day class is a room on a regular school facility; however, the students receive intensive 1:1 or small group instruction.

This class has twelve students: ten boys and two girls. The classroom is located among several general education classrooms. The students in the SH class follow the same bell schedule and school activities as the general education population. Although the study was conducted in this classroom, the study participants were separated from the other students in the class who did not participate in the study during the music therapy sessions. The study participants worked in a *quiet room* environment to prevent outside distractions and interruptions during the sessions. This *quiet room* was within the classroom boundaries.

Participants

The subjects of this study are students in the SH special day classroom. All the subjects have a diagnosis of autism on their IEP (Individual Educational Plan) and are considered to be within the severe range of the spectrum, according to the Childhood Autism Rating Scale (Schopler, Reichler, & Renner, 1986) in the subjects' school files. This was a convenience sample: the five participants were all male, have a diagnosis of autism, and are students in the program. The ages of the subjects range from 5-yrs 6-months to 9-years 2-months. One subject is of Russian decent; two are Chinese, one Hispanic, and one Caucasian. All subjects are residents of the school district.

Each subject has a varying degree of communicative ability. All the subjects respond to and use English whenever possible. Three of the subjects were considered *non-verbal* and communicated through alternative means (e.g., PECS or an Alternative Augmentative Communication Device called *AAC*). The other two

subjects had verbal communication abilities, but they lacked communication intent and rarely used spontaneous communication. All of this became know to the investigator through observations and experience working with the subjects prior to the study. As their teacher, she had already worked with the students for time periods ranging from 4 months to 3 years and 4 months.

Materials

The subjects who were exposed to the music therapy approach during treatment sessions were exposed to music developed by *Coast Music Therapy*. The program used is called *Tuned In to Learning* (CMT, 2005). The program had a 100-page spiral-bound book with photographs corresponding to the song lyrics. The program was accompanied by a CD, which had pre-recorded songs that corresponded with the book.

Procedure

The subjects were selected from the six participants available for inclusion in the study due to accessibility to subjects diagnosed with autism. The investigators are the classroom teacher who performed this study and the music therapist assigned to this classroom. The music therapist was essential for the study because a licensed therapist is necessary for providing therapy in the classroom setting. The investigator and the music therapist worked collaboratively with the subjects, both collecting data and teaching sessions. The study lasted over nine days, involving twenty-minute sessions for each group. In order to address the issues of history and maturation associated with this study design, the subjects received the nine sessions in a short

period of time. All the subjects received the same treatment for the first three days, or baseline period. During the next three days, the subjects received the treatment of teaching using a music therapy approach. On the final three days, the group received the same treatment as they had during the first three days.

The group of five subjects worked together during sessions and the group received a teaching session with the investigator and the music therapist collaborating and taking turns as the instructor. The investigator and the music therapist collected data on tally sheets for each child during each opportunity for communication. There were four target skills being taught: *social greetings*, *naming colors, asking for a snack,* and *saying "good-bye" to the investigator and/or music therapist*. Familiar pictures were used to help label the communication being taught and modeled. Non-responses from the subjects were ignored and no tallies were documented for the trial. Wait time for answers was five seconds counted silently by the investigator and music therapist.

The first target skill was communicating socially and targeted saying, "Hi." The investigator held up a picture of a child waving and the word */Hi/* under the picture. The investigator said, "Hi," followed by each participant's name, while waving and attempting to make eye contact. The investigator looked and listened for the following, including any combination of the following: (a) eye contact from the subjects; (b) a wave; (c) a verbal response including, but not limited to, "Hi"; (d) a sound resembling an /*h or /i/* sound; (e)"Hi, teacher"; (f) "Hi" followed by the investigator's name; or (g) any other verbal intent without further prompts. If any or

all of these communication components were displayed, with or without the use of a communication aide, it was documented on the tally sheet.

The second target skill was naming the colors of the rainbow: *red, orange, yellow, green, blue, and purple*. Color cards with the color words on them were held in front of the subjects, and they were asked to touch or name the colors shown. The communication for this activity was to use the color name (correct or incorrect responses were documented as a verbal communication). For the non-verbal subjects, the use or intent to use a communication device for an answer was considered intent to communicate. Eye contact was also observed and documented when a subject was asked to name a color as a form of communication intent. Each subject had the opportunity to name three colors during this portion of the session.

The third target skill was asking for a snack. The investigator held a picture of a cracker in front of the subject and asked, “Do you want a snack?” Acceptable communications from students included: verbalizing any of the following phrases; “Snack”; “Want snack”; “I want snack”; or “Cracker.” Other communication intent was also documented as a non-verbal attempt. These included a wave and/or a sign or hand movement towards the mouth. Eye contact during the trial was also documented. Each subject had one opportunity to communicate the desire for the snack (cracker) during this session. Correct responses resulted in the subject receiving a cracker.

The fourth target skill was to communicate, “Good-bye.” The investigator held a picture of a child waving good-bye with the word */Good-bye/* under the

picture. The investigator approached each subject and made eye contact while waving good-bye and saying, “Good-bye,” followed by the subject’s name. Acceptable responses included but were not limited to, “Bye”;“G-bye”; “Bu”;“Bye-bye”;“Good-bye”;“Good-bye, teacher”; and “Good-bye,” followed by the name of the investigator. Other communication intents documented include; waves, a touch, use of an alternative communication device, and/or eye contact. A tally for each type of communication intent was documented for each subject during each trial attempt. Baseline data was collected and group data was compared. For students who responded with a verbal response, the exact verbal response was noted on the subject’s data sheet.

On Days 4-6, the group of six subjects received a music therapy approach using the *Tuned in to Learning* program. The picture cards and conditions remained the same. The group was taught for the same amount of time and under the same conditions as they had been during Days 1-3. The treatment intervention for the group was the use of songs to teach the four target skills. The investigator and/or music therapist sang the lyrics to songs created by *Coast Music Thera*py targeting the same skills. Communication intent described from Days 1-3 was observed and tallied for each of the six participants in the group.

Days 7-9 were identical to Days 1-3. Data collection continued as a posttest to determine the level of growth from each of the subjects. The investigator and the music therapist debriefed after each session to discuss what were observed. All

sessions followed the same routine and were done at the same time of day and in the same order to prevent invalidity.

Analysis

Data was collected on each student during each of the nine sessions. The communication intent that was tallied was eye contact, and verbal and non-verbal communications. Specific verbal communications were documented to look for growth in both use of language and length of communications. The investigator and the music therapist examined the amount of communication intent for each student during each session for the first three days to get a baseline for the group. A mean score was taken to determine the baseline for each student's communicative intent during the first three days of intervention with the typical teaching approach without music. This pre-test was taken to determine a baseline for each subject. Specific communications were also documented for each subject to compare with posttest data.

During Days 4-6, the investigators introduced the treatment of teaching the previously described skills using a music therapy approach. Data was collected to determine the level of improvements during the therapy sessions.

On Days 7-9, the tally marks were added and the mean scores were taken for each subject in the group as a post-test. Post-test scores were subtracted from pre-test scores to determine the treatment effects.

Limitations

One limitation that arose from the study was access to subjects, and consequently a small group. Because the investigator was limited to students in the special education program, only six subjects were available for the study. Time was also a limitation. There was only a four-week availability for the study; therefore, the study had to be broken up into three, three-day sections. Unexpected absences of subjects were to be expected and accommodations were made to ensure that these subjects were able to continue the study. A third limitation of this study was the investigator's familiarity with the students. Because the investigator has worked with these subjects for up to three years, it made it difficult (a) for the investigator to be objective about the subjects' responses, and (b)ensuring accuracy in data collections. A fifth limitation was that history and maturation was not controlled. The sessions were scheduled in a short period of time to address this issue.

Conclusion

The next chapter shows the data that was collected from the study. This chapter has the findings of the amounts of communication and intent that all the subjects used during the baseline trial phase exhibited. It also shows the specific communications used for each child during each skill attempt for all nine sessions. The data shows how the subjects responded before treatment, during the treatment phase, and post treatment. This chapter also shows the findings of the posttests of all subjects and the comparison scores from the pretests.

CHAPTER FOUR

Results

Results

All tables show the number of attempts to communicate by eye-contact, non-verbal communication (gestures, pointing, touching materials or observer) and verbal communication, during pre-test sessions, music therapy sessions, and post-test sessions. Each subject had ten opportunities to communicate during each session. The investigator documented each incident of communication by tallying on a data sheet for each session. Median scores were taken for each scoring period: pre-test, intervention of the music therapy approach, and post-test. The tables represent the scores from each subject across all sessions.

Figure 1 shows the results from the data collection of Subject #1 during all nine sessions. Subject #1, Tim (a pseudonym), responded primarily with verbal communication during all phases of intervention. Correct and incorrect responses were recorded as verbal intent, and the subject was given credit for incorrect responses. Tim's verbal communications over the nine sessions were: "Hi," "blue," "red," "orange," "yellow," "green," "purple, "snack," and "Bye." Tim did, however, show a greater increase in eye-contact during the treatment phase than in pre- or post-test sessions. Tim also demonstrated an increase in both verbal and non-verbal communication during the post-tests.

Figure 2 presents the data for Subject #2, Sheldon (a pseudonym), who answered verbally on every opportunity. He also received credit for incorrect and correct responses. Sheldon responded with the following verbal responses over the

nine sessions: " Hi, Jenn," "blue shirt," "red car," "orange," "yellow lemon," "green leaf," "purple hat," "I want snack," "cracker," and "Bye-bye." Sheldon increased his eye-contact and non-verbal responses during the music therapy sessions; however he did not continue to use these responses as frequently during the post-test sessions.

In Figure 3, Subject #3, Ian's (a pseudonym) responses represent his use of a dynamic communication device for all verbal output. Ian showed an increase in all areas during the music therapy sessions. He gave verbal responses with his device that included: "Hi," "blue," "red," "yellow," "green," "orange," "purple," "cracker," and "Bye." Ian was given credit for responding verbally when he used his device both with correct and incorrect responses. Although his non-verbal and eye-contact decreased during the post-test sessions, he still increased his use of non-verbal communications and eye-contact from the pre-test sessions.

The responses for Subject #4, Paulo (a pseudonym), are shown in Figure 4. Paulo is considered a non-verbal child and makes random, usually unintelligible utterances, rather than spoken words. Paulo also used a PECS (Picture Exchange Communication System) book during all sessions. He used his book to request, "I want snack" and was given credit for verbal output. Paulo showed an increase in all areas during the music therapy intervention sessions. He averaged two instances of eye-contact during the music phase and during post-tests. Paulo used gestured for every opportunity across all sessions, but on average he increased his verbal output during the music therapy sessions. His verbal output included: " Huh" (Hi), "wa-wa" (want), "bu" (blue), "ooha" (orange), "bu bu" (Bye).

Finally, the results for Subject #5, Igor (a pseudonym), are shown in Figure 5. Igor is also a non-verbal child. Igor also uses a PECS book. Igor uses a lot of gesturing including, pointing, touching the investigator's hands, gesturing towards his mouth. Igor made a slight increase in eye-contact from pre-tests to the music and post-test sessions. He was consistent in non-verbal communications and made an attempt on every opportunity in all sessions. Igor made no verbal output during the first six sessions; however, he showed an increase during the post-test sessions but initiating with his PECS book to request a cracker, and on one occasion he verbalized the sound "bu," which was interpreted as "Bye."

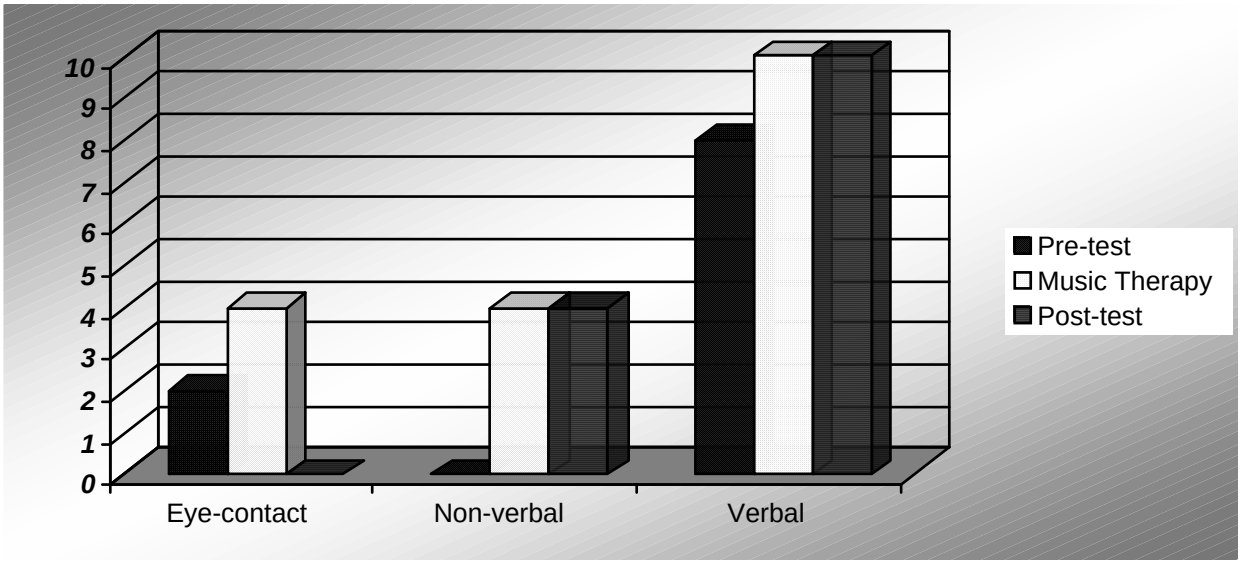

Figure 1. Tim's communications.

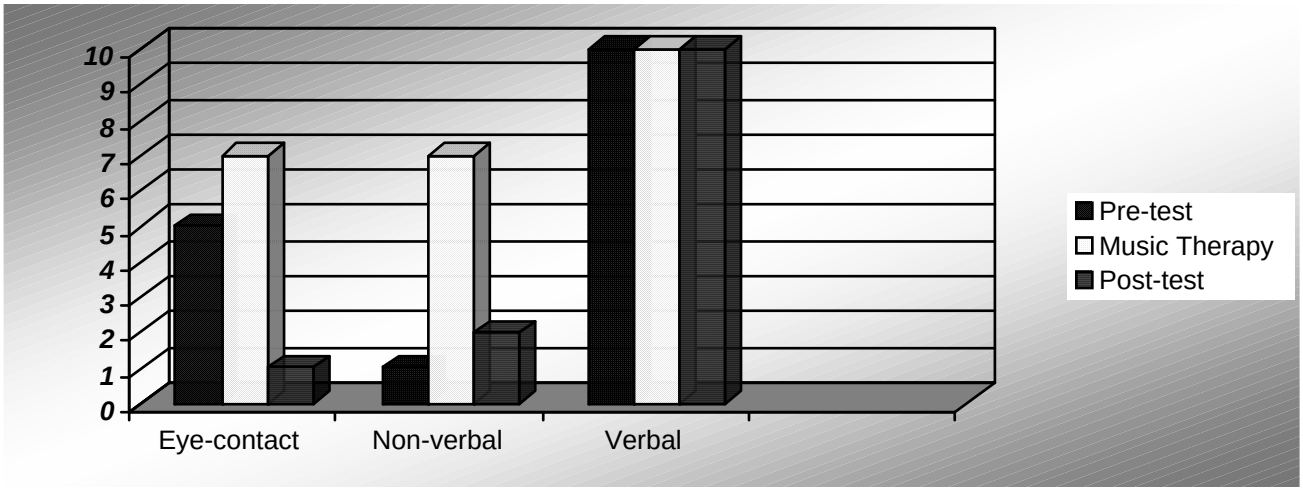

Figure 2. Sheldon's communications.

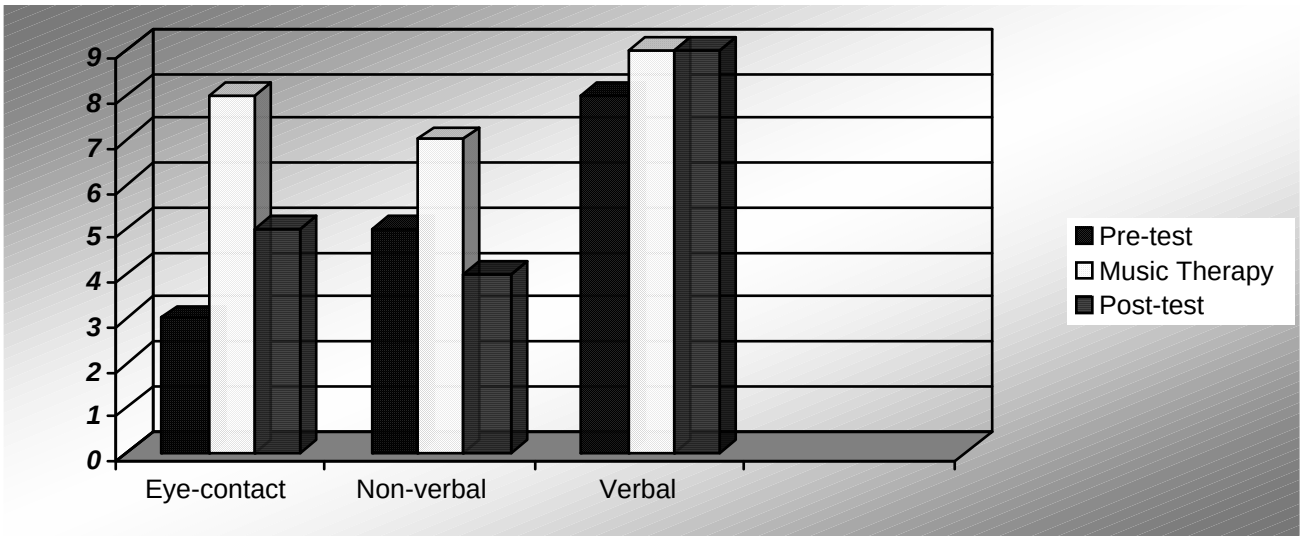

Figure 3. Ian's communications.

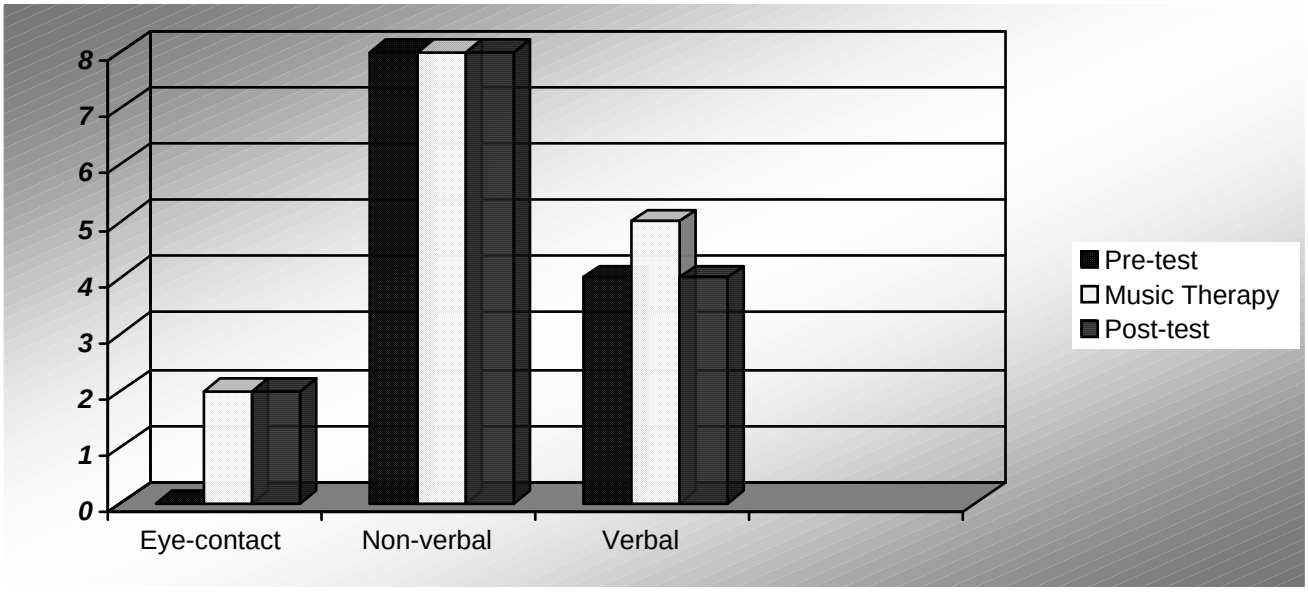

Figure 4. Paulo's communications.

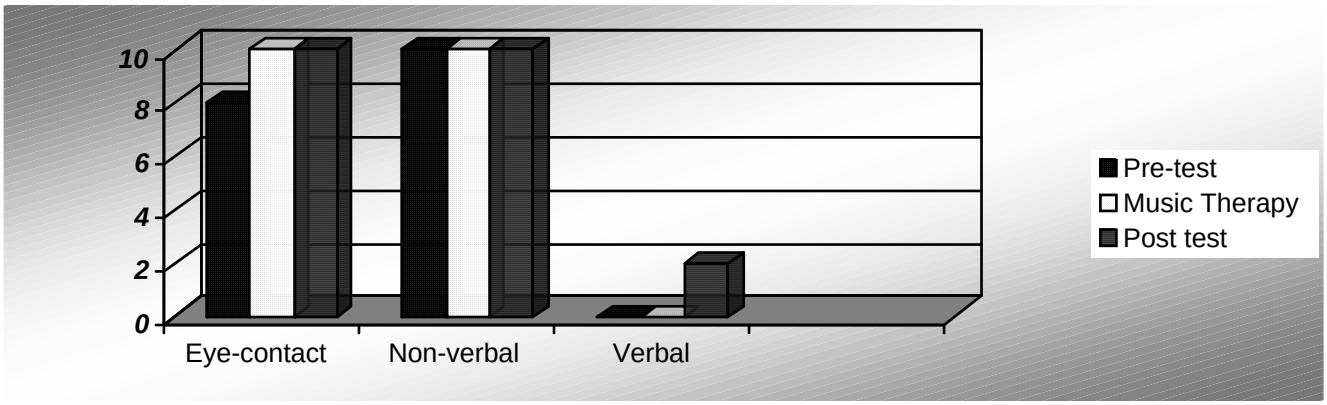

Figure 5. Igor's communicatios.

CHAPTER FIVE

Conclusion

The use of a music therapy approach to teaching students with severe autism was effective for all five children. When the pre-test sessions began, each child had an area of communicative weakness and most of the subjects had a preferred method to communicate either non-verbally or verbally. Most of the subjects with the exception of Subject #5, Igor, rarely used eye-contact during the pre-test sessions. After analyzing the data, most of the subjects increased their use of eye-contact both during the music therapy approach sessions and during post-test sessions. The majority of increases in all three of the communication areas were most prevalent during the music therapy approach sessions. This increase in communication is encouraging and shows that children with autism do benefit from a music therapy approach to learning. Because the children all did not sustain the same levels of communication during the post-test phase, one could assume that they benefit from the music therapy approach.

This study had a few limitations. First, students could not be consistently tested with the same group of children for each session as the study had time constraints and some children were absent from school on some of the session days. The children who missed a session were tested on a later day when they returned to school. Second, testing had to be done during different times of the day and fatigue could have been a factor in test results. Third, the length of time available for the study. Because the study took time gaining approval and parent consent, along with

school holidays, there was a limited amount of time available for the study. Fourth, the results are not generalizable due to the small number of subjects involved in this study. One could determine from the results that these five particular subjects did benefit from a music therapy approach, it is not, however, assumed that all children with autism would benefit from this type of therapy approach. Fifth, the researcher's familiarity with the subjects and length of time having worked with these particular subjects in lengthy and limits the researcher's objectivity in the study.

The results of the data show that subjects in the study were able to give more eye-contact and gave more instances of verbal responses during the music therapy approach, but not following in the post-test sessions. Most subjects flourished in all areas during the music therapy sessions, but were not able to continue to use these skills in the following sessions. During short sessions, however, the subjects made some obvious improvements. The implications of the data would be that the researcher may want to consider continuing to use this same approach more often on a regular basis and explore other skill areas, such as, reading, math, writing, typing, social skills, etc., to use the music therapy approach.

The questions that arose from this study include: Would the subjects have sustained more of the communications skills post-study if the study had been longer? Would the subjects be able to begin to generalize the use of communications skills after sessions and use of a music therapy approach on a continuing and consistent basis? Would the music therapy approach help to develop communication skills between peers? Would this study help students with autism that are on the *mild*-

moderate end of the spectrum? Is it possible to imbed music therapy approaches into the daily routine in special day classes to help benefit those on the autism spectrum?

The implications of this study are very valuable for teachers in the area of special education. The findings of this study suggest that some teachers who are working with children on the *severe* end of the autism spectrum might want to consider using music in the classroom to help develop communications skills and support learning. “The Coast Music Therapy Curriculum” that was used for this study could be used in a variety of classrooms to help teachers, who may or may not struggle musically, to expose children with autism to music in the curriculum.

Further research is needed to determine the long-term effects of using a music therapy approach in helping to develop communication and other skills in children with autism. Research also should explore the benefits of using a music therapy approach with children on the spectrum in a variety of environments and focus on a variety of skills. It would be helpful to have research on music therapy with a large variety of students across many age ranges to see if there are long term benefits to using this approach. It would be very interesting to see a study that using music therapy in a variety of ways to work with children who have been recently diagnosed and/or in a pre-school program as a part of the early intervention strategies to developing language. Because of the large number of children diagnosed with autism using PECS, it would also be interesting to see a study explore the use of a music therapy approach to teaching and using PECS in the classroom.

In summary, this study supports the advancement of using music to improve communication skills of children with autism. It also supports the possible use of the music therapy approach for children whose disabilities place them on the *severe* end of the autism spectrum to teach a variety of skills. It is recommended that other teachers explore the use of a music therapy approach to teaching and helping to develop both communication and academic skills.

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